

Manual (Part A) and Vol. 2 Ecological Assessment (USEPA, 1989), The Exposure Factors Handbook (USEPA, 1989), and Risk Assessment Guidance for Superfund Human Health Risk Assessment, USEPA Region IX Recommendations (USEPA, 1989).

The Glendale North OU risk assessment estimated the potential risks to public health under current situations and potential future situations. The risk assessment examined the potential health effects if individuals were exposed to contaminated groundwater from the upper and lower zones of the aquifer of the Glendale north plume of groundwater contamination in the Glendale Study Area.

The risk assessment (RA) provided both qualitative and quantitative information that demonstrate the potential for risk. It includes the basic components outlined in the guidance as follows: introduction, identification of compounds of potential concern, exposure assessment, toxicity assessment, risk characterization, uncertainties, and ecological assessment.

The steps taken to perform the risk characterization for the Glendale North Operable Unit (OU) are described in Section 7.5 (pp. 7-17 to 7-21) of the RI Report for the GSA. The methodology presented is "as per guidance" for carcinogens and non-carcinogens and calculates a lifetime probability of cancer risk (exposure dose times EPA slope factor) and hazard index (exposure dose divided by EPA risk reference dose).

The extent of data collected for groundwater was deemed adequate to define the plume and was deemed of sufficient quality for use in this RA, as per EPA guidance on data usability.

Initial review of data collected indicated the primary pathway of concern to be elevated concentrations of compounds in groundwater. Therefore, the exposure assessment focused on this identification and characterization (qualitative and quantitative) of potential risk via this exposure pathway. Current and most likely future exposures were characterized.

The most current groundwater sampling at the time the risk assessment was conducted was used to create the risk assessment database and the most current toxicity values for compounds of concern as per the EPA IRIS database (1991) and EPA HEAST document (1991) were used in the quantitative risk calculations.

The arithmetic mean, the reasonable maximum exposure and maximum exposure estimates were all calculated and used in this characterization and evaluation of risks for this RA (Sections 7.5.3 and 7.5.4 of the RI Report for the GSA).

The site-specific uncertainties, as well as uncertainties inherent in the general RA guidance methodology, were described and

evaluated in Section 7.6 of the RI Report for the GSA. Determination as to under- or over-estimation of risk is presented.

In summary, EPA risk assessment guidance was used to focus the baseline risk assessment for the Glendale North OU resulting in an adequate characterization of the risks posed by exposure to elevated concentration of compounds in groundwater.

16. II. C. - ITT further states that these risk assessment deficiencies indicate that the technical basis for estimating the risks posed by the site or for selecting an alternative that will control or eliminate risks to human health and the environment was inadequate, leading to a waste of resources to "overclean" the site.

EPA Response: The site will not be "overcleaned." Again, EPA would like to emphasize that the Glendale North OU is an interim action. This interim action was specifically developed to address contamination in the shallow groundwater of the Glendale Study Area. The objectives of this interim remedy are to begin to remove contaminant mass from the shallow aquifer and to inhibit the further migration of contamination in the shallow aquifer both laterally and vertically. Thus, with regard to the Glendale North OU interim remedy, since it is not EPA's objective to eliminate all risks or to complete a final remedy for the Glendale area of the San Fernando Valley, it is not possible that the OU will "overclean."

17. II. C. 1. - ITT stated that although EPA refers to "potential COCs" in the FS discussion of the risk assessment, EPA did not define this acronym anywhere in either the FS or the RI.

EPA Response: The acronym "COC", representing compounds of concern, was defined in the FS report for the Glendale North OU (April 1992), on page 1-3. This acronym was not used in the RI for the Glendale Study Area, but the term "compounds of concern" was used (See Section 7.4.1 of the RI Report).

18. II. C. 1. - ITT stated that the uncertainty associated with the risk assessment must be characterized for the risk assessment to provide appropriate information into the risk management decision process.

EPA Response: The uncertainties were discussed at length in Section 7.6 (Uncertainties) presented under Section 7: Baseline Risk Assessment for the Glendale North Plume OU of the RI Report for the Glendale Study Area.

19. II. C. 2. a. - ITT stated that ingestion of groundwater and shower exposures to groundwater were characterized improperly as "potential current" exposure pathways.

EPA Response: EPA uses the term "potential current exposure pathway" to refer to ways that the public could be exposed to risks given the current understanding of the contamination at a site assuming that no action is taken to prevent exposure. For example, for Glendale North, the "potential current exposure pathway" assumes public use of the groundwater assuming no treatment for VOCs. Sampling data from the September 1989 and September 1990 sampling events were used to represent "current" or existing contamination conditions in the groundwater of the Glendale north plume. The potential exposure pathways used to estimate the risks to human health were ingestion or inhalation of the untreated groundwater. Currently, no one is actually drinking or using groundwater with contamination in excess of the MCLs. Therefore, exposure to this untreated, contaminated groundwater was characterized, appropriately, as a "potential" current exposure.

20. II. C. 2. b. - ITT stated that the risk assessment did not realistically or appropriately assess steam plant exposures as a pathway. It employs a box model, which is a screening-level analysis and is likely to over estimate exposures when compared to traditional emission and dispersion models. ITT further stated that a box model may be an appropriate tool to estimate exposures near the source. However, the exposure assessment must provide a more detailed analysis of the model's use than does the RI.

EPA Response: EPA disagrees with this comment. As stated in point 7 (page 7-25), Section 7.6 (Uncertainties) of the Baseline Risk Assessment for the Glendale North Plume OU presented in Section 7 of the RI Report for the Glendale Study Area: "The box model used in determining possible risks from the steam plant is conservative." The use of the box model to estimate exposure point concentrations for the steam plant exposure scenario although conservative is consistent with EPA guidance (EPA Risk Assessment Guidance for Superfund Sites and EPA Exposure Factors Handbook [1989]). It should be noted that alternate model calculations would not be expected to result in risk estimates below the guidance benchmark of 1×10^{-6} , given the elevated concentrations in the groundwater at the site.

21. II. C. 2. c. - Explain how multiple conservative assumptions are used in the risk assessment and how they influence the risk assessment's final conclusions.

EPA Response: This is discussed in Section 7.6 (Uncertainties) of the Baseline Risk Assessment for the Glendale North Plume OU presented in the RI Report for the Glendale Study Area. The direction of influence as to whether the uncertainty under- or over-estimates the risks calculated are defined and are incorporated into the risk evaluation section (7.5.4) of this report.

22. II. C. 2. c. - ITT indicated that the risk assessment did not address the cumulative uncertainty in employing multiple conservative assumptions. ITT further stated that EPA guidance suggests that the use of several conservative assumptions can lead to unrealistically conservative bounding estimates. Specifically, ITT stated that:

- The risk assessment is overly conservative, representing occurrence probabilities at or beyond the traditional conservative upper 95 percent levels used to assess worst-case exposures.
- The exposure frequency used by EPA is unnecessarily conservative because it is far too unrealistic to assume that all residents of the study stay at home 24 hours a day for 365 days a year for 30 years.
- The screening-level model used by EPA that assumes shower exposure is equivalent to ingestion of two liters of water should be confirmed with a more definitive model because it significantly elevates overall risk estimates.
- EPA should have included a discussion of the uncertainties associated with the use of this screening-level model into the uncertainties section of the risk assessment to provide appropriate and necessary risk characterization into the risk management process.
- The risk assessment's definition of the reasonable maximum exposure (RME) for the Glendale Study Area does not take into account significant levels of uncertainty in the frequency or duration of exposure, toxicity estimates, intake estimates, or the multiple routes of exposure that are combined to estimate the total exposure.

EPA Response: The decisions represented in the risk assessment are conservative, but not unrealistic. The exposure assumptions, modeling concentration estimates, and exposure equations are all standard recommended elements of current USEPA guidance for Risk Assessment at Superfund Sites (USEPA, 1989) and the EPA Exposure Factors Handbook (USEPA, 1989). The cumulative effort of this conservative approach is inherent in the guidance methodology as currently written. This RA has not exceeded the guidance. This conservative approach is designed to ensure adequate characterization of potential human health risks. Further, risk estimates for average concentration levels are provided for use by the risk manager in remediation decision-making and were discussed in the risk evaluation section, Section 7.5.4, of the Glendale RI in order to assign significance to the risk values calculated.

Again, the exposure frequency used in the risk assessment is a standard default assumption for residential exposure as presented in the EPA Exposure Factors Handbook (USEPA, 1989).

The conservative approach existing in the use of an ingestion equivalent to estimate risks via inhalation during showering is duly noted in Section 7.3.4 (pp. 7-9) of the RI Report. It is further noted that alternate models may be used to predict potential risk, as further defined in the uncertainties section (Section 7.6; pp. 7-25, Point 6). Given the elevated concentrations of volatile organics in the groundwater, it would be expected that an alternate calculation would not result in risk predictions below the guidance benchmark of 1×10^{-6} .

The uncertainty inherent in the RME calculation of risk estimates is accounted for in the uncertainties section (7.6) of the RI Report and is also included in the evaluation section (7.5.4) which addresses the significance of the risks predicted.

23. II. C. 3. - EPA uses maximum contaminant levels ("MCLs") for lead ingestion in determining the dose-response relationship because there is no established reference dose for lead. ITT disagrees with this use of the lead MCLs for two reasons:

- 1) MCLs are a treatment-based standard rather than a health-based standard and its use is inappropriate in a toxicity assessment.
- 2) There are several alternative methods that EPA could have relied on in setting a reference dose for lead.

EPA Response: EPA disagrees that these additional comments would have any impact on project management decisions. Note too, that risk information from an "actual risk" is not typically used in making management decisions. Rather, hypothetical risks associated with the reasonable maximum exposure are used to direct management decisions. Actual risks are likely to be lower than those estimated for the RME, and could even be zero.

The use of the MCL to calculate a hazard index value for lead in order to provide a quantitative benchmark for consideration by the risk manager is adequately evaluated with regard to public health significance in Section 7.5.4, pp. 7-23 of the RI Report for the Glendale Study Area. The uncertainties and limitations to this approach are noted in the RI Report, on pp. 7-23 and in Section 7.6.3 (Uncertainty in the Characterization of Risks), pp. 7-28.

24. II. C. 4. a. - ITT stated that EPA did not fully explain the risk characterization; and did not provide a clear and understandable explanation of the identified risks.

EPA Response: EPA disagrees with this comment. Section 7.5 of the RI Report for the Glendale Study Area thoroughly addresses risk characterization for the Glendale North OU.

25. II. C. 4. b. - The Risk Assessment uses bounding estimates rather than high-end estimates. Bounding estimates cannot be used to determine that a pathway is significant and they cannot be used for an estimate of actual exposure. The risk assessment attempts to use bounding estimates to accomplish these two objectives.

EPA Response: The presentation of average, RME, and maximum risk predictions for potential human health effects is designed to provide the risk manager with the range of risk probability that may be posed via exposure to groundwater from the site. Use of these values allows the risk manager to make reasonably conservative remediation decisions. The significance of these risk predictions is addressed in Section 7.5.4, pp. 7-22 to 7-24, of the RI Report for the Glendale Study Area.

26. II. C. 4. b. - An air diffusion model should be conducted in lieu of the box model to determine residential inhalation or exposures and a shower exposure model utilized in lieu of the assumed equivalence of showering to ingesting two liters of water. The current estimates significantly overstate the high-end exposures and do not reflect a realistic or useful estimate of the associated risk.

EPA Response: The box model used to estimate exposure point concentrations for air in the steam plant and shower exposure scenarios, although conservative (as noted in RI Section 7.3.4 - Exposure Assessment and RI Section 7.6.1 - Uncertainties in Exposure Assessment), are in accordance with methodologies defined by EPA guidance including, Risk Assessment Guidance for Superfund Sites (USEPA, 1989) and EPA Exposure Factors Handbook (USEPA, 1989).

While there are uncertainties associated with the model, it is not expected that the use of an air diffusion model would result in risk prediction below the guidance benchmark of 1×10^{-6} , given the elevated concentrations of volatile organics in groundwater of the Glendale north plume. Thus, the risk calculations and subsequent remediation decision-making would remain the same.

27. II. C. 4. c. - The risk assessment does not adequately account for uncertainties. There are multiple uncertainties inherent to the RI exposure assumptions that are not explained in sufficient detail.

EPA Response: See EPA Responses to ITT Comments 18, 21 and 22.

28. II. C. 4. c. - ITT stated that EPA did not specify reference doses or slope factors for all potential COCs, instead it chose to